



IPW

Attorney Docket No. 1454.1615

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Thomas HAUSTEIN, et al.

Application No.: 10/535,209

Group Art Unit: 2143

Confirmation No. 9399

Filed: December 14, 2005

Examiner: Unassigned

For: MIMO SIGNAL PROCESSING METHOD INVOLVING A RANK-ADAPTIVE MATCHING
OF THE TRANSMISSION RATE

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 CFR § 1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the subject application.

1. Enclosures accompanying this Information Disclosure Statement are:

- 1a. ☒ Form PTO-1449.
- 1b. ☒ Copy(ies) of IDS citation(s), except for U.S. Patents and U.S. Patent Application publications.
- 1c. ☒ copy of a communication(s) from a foreign Patent Office or a PCT International Search Report.
- 1d. ☐ English language translation (complete, Abstract or relevant portion(s)) attached to non-English language publications as indicated on the attached Form PTO-1449.
- 1e. ☐ Explanations of Relevancy of References (ATTACHMENT 1(e), hereto) for providing a concise explanation of non-English publications.
- 1f. ☐ List of Copending Applications (ATTACHMENT 1(f), hereto).
- 1g. ☐ List of Additional Submitted Documents (ATTACHMENT 1(g), hereto).

2. ☒ This Information Disclosure Statement is filed under 37 CFR § 1.97(b):

(Check either Item 2a or 2b or 2c or 2d)

- 2a. ☐ Within three months of the filing date of a national application;
- 2b. ☐ Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application.
- 2c. ☒ Before the mailing of a first Office Action on the merits; or
- 2d. ☐ Before the mailing of a first Office Action after the filing of a Request for Continued Examination under § 1.114.

3. ☐ This Information Disclosure Statement is filed under 37 CFR § 1.97(c) after the period specified in paragraph 2 above but before the mailing date of any of a Final Office Action under § 1.113, a Notice of Allowance under § 1.311 or an action that otherwise closes prosecution in the application, AND

(Check either Item 3a or 3b; Item 3b to be checked if any reference known for more than 3 months)

- 3a. ☐ The § 1.97(e) Statement in Item 5 below is applicable; OR
 3b. ☐ The \$180.00 fee set forth in 37 CFR § 1.17(p) is:
☐ enclosed.
☐ to be charged to Deposit Account No. 19-3935.

4. ☐ This Information Disclosure Statement is filed under 37 CFR § 1.97(d) after the period specified in paragraph 3 above, but on or before payment of the Issue Fee, AND

- 4a. ☐ The § 1.97(e) Statement in Item 5 below is applicable; AND
 4b. ☐ The \$180.00 fee set forth in 37 CFR § 1.17(p) is:
☐ enclosed.
☐ to be charged to Deposit Account No. 19-3935.

5. ☐ Statement under § 1.97(e) (*applicable if Item 3a or Item 4a is checked*)

(Check either Item 5a or 5b)

- 5a. ☐ In accordance with 37 CFR § 1.97(e)(1), it is stated that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.
 5b. ☐ In accordance with 37 CFR § 1.97(e)(2), it is stated that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known by any individual designated in § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement.

6. ☐ This is a continuation/divisional/continuation-in-part application under 37 CFR § 1.53(b).

(Check appropriate Items 6a and/or 6b)

- 6a. ☐ Copies of the publications listed on the attached Form PTO-1449 which were previously cited in prior application Serial No. __, filed on __, and which is relied on for an earlier effective filing date for the subject application under 35 U.S.C. § 120, have been omitted pursuant to 37 CFR § 1.98(d).
 6b. ☐ Copies of the publications listed on the attached Form PTO-1449 which were not previously cited in prior application Serial No. __, filed on __, and which is relied on for an earlier effective filing date for the subject application under 35 U.S.C. § 120, are provided herewith.

7. ☐ This is a Request for Continued Examination under 37 CFR § 1.114.
(Check either Item 7a or 7b)
- 7a. ☐ The Issue Fee has not been paid.
- 7b. ☐ A Petition to Withdraw from issue under 37 CFR § 1.313(c) is filed concurrently herewith or has been granted. A Request for Continued Examination under 37 CFR § 1.114, after payment of the Issue Fee, is proper in accordance with 37 CFR § 1.114(a), respectively.
8. ☐ This is a Supplemental Information Disclosure Statement.
(Check either Item 8a or 8b)
- 8a. ☐ This Supplemental Information Disclosure Statement under 37 CFR § 1.97(f) supplements the Information Disclosure Statement filed on _____. A bona fide attempt was made to comply with 37 CFR § 1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental IDS can be considered as if properly filed on _____.
- 8b. ☐ This Supplemental Information Disclosure Statement is timely filed within one (1) month of the Notice under 37 CFR §§ 1.97 and 1.98, mailed _____.
9. ☐ In accordance with 37 CFR § 1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:
(Check appropriate Items 9a, 9b, 9c and/or 9d)
- 9a. ☐ satisfied for the non-English language publication(s) cited on the enclosed "English language version of the search report or action which indicates the degree of relevance found by the foreign office". (See MPEP § 609, Minimum Requirements for an Information Disclosure Statement, Part A(3): Concise Explanation of Relevance, 8th Ed., Rev. 2)
- 9b. ☐ set forth in the application.
- 9c. ☐ satisfied for the non-English language publication(s) indicated on the attached Form PTO-1449 as having an English language translation (complete or relevant portion(s)) attached thereto.
- 9d. ☐ enclosed as Attachment 1(e), hereto.
10. No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than search report(s) from a counterpart foreign application or a PCT International Search Report, if submitted herewith). 37 CFR §§ 1.97(g) and (h).

11. The Commissioner is authorized to credit any overpayment or charge any additional fee required under 37 CFR § 1.17 for this Information Disclosure Statement to Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Dated: March 14 2007
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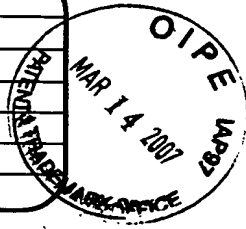
INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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| Sheet | 1 | of | 2 |
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Complete if Known

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|------------------------|-----------------|
| Application Number | 10/535,209 |
| Filing Date | 10.11.2003 |
| First Named Inventor | Thomas Haustein |
| Art Unit | |
| Examiner Name | |
| Attorney Docket Number | 2004P20577WOUS |



U.S. PATENT DOCUMENTS

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FOREIGN PATENT DOCUMENTS

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|-----------------------|--|--------------------|--|
| Examiner Signature | | Date Considered | |
|-----------------------|--|--------------------|--|

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This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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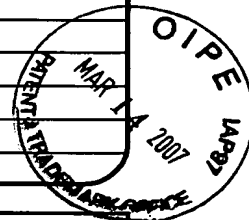
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Complete if Known

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|------------------------|-----------------|
| Application Number | 10/535,209 |
| Filing Date | 10.11.2003 |
| First Named Inventor | Thomas Haustein |
| Group Art Unit | |
| Examiner Name | |
| Attorney Docket Number | 2004P20577WOUS |

**OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS**

| Examiner Initials * | Cite No. ¹ | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T ² |
|------------------------|--------------------------|---|----------------|
| | 3 | TELETAR, E.: "Capacity of Multi-antenna Gaussian Channels" European Transactions on Telecommunications; vol. 10, Nov/Dec. 1999; pages 585 - 595 | |
| | 4 | LEBRUN F. YING T, FAULKNER M.: "MIMO transmission over a time varying TDD channel using SVD" in Electronics Letters; 25th October 2001; vol. 37, No. 22, pages 1363-1364 | |
| | 5 | CATREUX S. et al.: "Adaptive Modulation and MIMO Coding for Broadband Wireless Data Networks". In IEEE Communications Magazine; June 2002; pages 108 to 115 | |
| | 6 | CATREUX S; DRIESSEN P; GREENSTEIN L.J.; "Attainable Throughput of an Interference-Limited Multiple-Input Multiple-Output (MIMO) Cellular System, IEEE Transactions on Communications; Vol. 49, No. 8; August 2001, pages 1307 - 1311 | |
| | 7 | KIESSLING M et al.; "Short-term and long-term diagonalization of correlated MIMO channels with adaptive modulation "Conference proceedings; 13 th IEEE 2002; Bd. 2; 15-18 September 2002; pages 593-597; XP010614294, | |
| | 8 | JUNGNICHEL V. et al.; " A MIMO WLAN based on linear channel inversion" IEE Seminar MIMO ; 12. Dec. 2001; pages 20/1-6; XP002277765, | |
| | 9 | GOLDEN G.D. et al.; Detection algorithm and initial laboratory results using V-BLAST space-time communication architecture.; Electronics Letters Vol. 35, No. 1, 07 th January 1999; pages 14-16; | |
| | 10 | CHUAH C.; et al. "Capacity Growth of Multi-Element Arrays in Indoor and Outdoor Wireless Channels"; Proc.of IEEE Wireless Commun. And Networking Conf. Chicago IL; Sept. 23-28, 2000 pages 1340-1344; | |
| | 11 | BLUM R.S.; et al "On Optimum MIMO with Antenna Selection" IEEE Communications Letters; Vol. 6, No. 8, August 2002; pages 322-324 | |
| | 12 | CHUNG S.T. et al.; "Approaching Eigenmode BLAST Channel Capacity Using V-BLAST with Rate and Power Feedback, Proc. IEEE VTC Fall 2001, Atlantic City NJ, 7-11 October 2001; pages 915-919 | |
| | | | |

Examiner
SignatureDate
Considered

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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